

DENSIFICATION AND SHAPE DEFORMATION CASES DURING SINTERING DESCRIPTION BASED ON SOLID MECHANICS

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Continuum Mechanics offers a useful tool to describe macroscopic aspects of powder compact sintering. Densification and shape deformations are two examples where solid mechanics can provide an accurate description. A resume of the viscous elastic analogy and the stress equilibrium problem statement are presented. Constitutive parameters such as uniaxial viscosity, viscous Poisson ratio and free sintering rate can be obtained measurements performed in a sinter forging unit or considering constitutive laws reported in the literature. Cases such as clay ceramics tiles and electronic packaging are studied with special attention on shape deformation, although densification is also important because nonuniform density maps potentially affect mechanical strength. Stress assisted sintering cases are also reported as an example to control densification.

Keywords: sintering, densification, solid mehcantics

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